

A backward treaded pedal-operated exercise bicycle with dual functions of outdoor and indoor exercising

Field of the invention

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The present invention relates to a dual functional pedal-operated exercise bicycle especially relates to a backward-tread pedal-operated bicycle having a crank means rotated in backward direction reversed to a conventional bicycle, in which a reaction force of a backward treading will push the rider tilted

10 forwardly in a running manner with his (her) gravity center to a front portion of the bicycle so as to increase the stability in a rapid changing of riding direction with less centrifugal force, and further having a rear wheel lifting stand attachably for an indoor exercising.

Background of the invention

Various pedal-operated vehicles have been patented over the years, most of them are mainly related to the tri-wheel vehicles only few of them are related to the exercise bicycles. However such bicycles have all had one or more drawbacks, for example: US. Pat. No. 1,977,035 of W. R. Benjamin discloses mainly a pedal-operated tri-wheel vehicle as shown from Fig. 1 to Fig. 8 in the patented document, but Fig. 9 and 10 discloses an additional embodiment of a pedal-operated bicycle having a chain wheel 69 mounted on a crank axis 59 directly rotated by the cranks in a forward pivot there will be a drawback that the tread force should be started at an instant when a crank roller 60 is rotated forwardly just passing over a top dead point of the rotating cycle. As shown in Fig. 1, a tread force F initiated at an instant while a crank roller just passing over a top dead point T, the direction of tread force F is forwardly tilted down, therefore a reacting force R in a reversed direction will naturally to push the gravity center of the rider tend to a backward position far from the front wheel, in which a larger centrifugal force will be occurred during a rapid change of riding direction in a high speed running, which may caused an accidental toppled over of the vehicle. In compare with Fig. 2, it shows an embodiment of the present invention which characteristically having a pair of transmitting gears 52 and 54 for providing a backward rotation of the crank means 30 for to change the direction of the tread force F into a tilted down backwardly, therefore a reacting force R' of the reversed direction then will push the rider forwardly with his (her) gravity center in a front position chose to the front wheel for high safety therefore.

Another prior art of U.S. Pat. No. 6,179,918 of Byron C. Coleman, the

prior art discloses a pedal-operated vehicle as shown in Fig. 2 of the document compressing a pair of pedal board respectively to drive a rope-pulled chain system 58 and 64 to instead the using of a crank and transmittion gears however there are drawbacks that firstly the operating mechanism is too complex,
5 secondary a wide lateral space is needed, and further it is too heavy with a complex mechanism and such a thick rear wheel as shown, and will coast too much for an exercise bicycle.

Further more, all the prior arts can not be used for an indoor exercise.

It is, therefore, a main abject of the present invention is to provide a
10 pedal-operated exercise bicycle characteristically in using a backward tread force for high safety.

Another main object is to provide a pedal-operated exercise bicycle, which can be used for an indoor exercise as well as an outdoor exercise.

Still another object is to provide a pedal-operated exercise bicycle, which
15 is light and low coast.

Detailed description to the drawings

Referring to Fig. 3 and Fig. 4, a preferable embodiment of the present invention showing a pedal-operated exercising bicycle 10 comprises :

5 a front wheel 12 ;

a rear wheel 14 mounted on a rear wheel shaft 16 at a rear end of a frame 18 ;

a pedal means 20 including a pair of pedal board 24 mounted on a padded shaft 22 at a front end of the frame 18, a vertical flange 26 upwardly raised from an inner side of each pedal board 24 respectively to protect to foot from an accidental slipping, and a slide slot 28 disposed under the pedal board 24 ;

a crank means 30 having a crank shaft 32 disposed on the frame 18, and two opposite cranks 34 each having a lateral roller 36 at an tip end thereof respectively inserted into a corresponding slide slot 28 of the pedals 24 to slide reciprocally therein, in which the cranks 34 rotated backwardly around the crank shaft 32 by a backward treading force of the feet of the rider so as to push the rider in a manner of running with his (her) gravity center G to a front portion of the bicycle (as shown in Fig. 2) for providing a high safety therefore ;

20 a chain system 40 including : a chain wheel shaft 42 disposed on the rear wheel shaft 16, a chain wheel 44 mounted on the shaft 42, a free wheel 46 mounted on the rear wheel shaft 16 drove by a chain 48 for running the rear wheel 14 forwardly therefore ;

a pair of matched transmitting gears including a driving gear 52 mounted on the crank shaft 32 and a driven gear 54 mounted on the chain wheel shaft 42 for transmitting a backward rotation of the chain system 40 so as to provide a

forward rotation of the rear wheel therefore.

Referring to Fig. 5, which showed a rear wheel lifting stand 60 to support the rear wheel 14 fixedly thereon for an indoor exercise comprising :

5 a base rack including a main lateral member 62 and two longitudinal members 64 disposed at two opposite ends of the lateral member 62 respectively, and a center member 66 extended backwardly from a center portion of the lateral member 62 ;

10 two rectangular columns 68 stood vertically from two opposite side of the lateral member 62 for holding two extended ends of the rear wheel shaft 16 which on a top of a right side column 68, a sleeve tube 72 with a half-cut mouth 74 is disposed thereon for receiving the right side end of the rear wheel shaft 16 and pushed thereinto, while on a top of a left side column 68 having sleeve tube 76 with a push lever 78 be able to push the sleeve tube 76 sliding to
15 sleeve the left end of the rear wheel shaft 16 therein ;

 a seesaw-typed friction device 80 disposed on the center member 66 including a supporting axis 82 at a center, a friction wheel 86 at a front end of seesaw-typed lever 84 be able in contact to the rear wheel 14 with an adjustable friction controlled by a position retaining bolt 88 at a rear end of the lever 84.

20 Fig. 6 is a perspective view to show the present invention is in an indoor exercise with the rear wheel had been lifted by the rear wheel-lifting stand.

 Fig. 7 shows an embodiment, which has a group of reduction chain gears 90 mount to a rear portion of the chain system 30 used for speed reducing while the bicycle is climbing up to a high ratio slop.

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Introduction of drawings

Fig. 1 showing a prior art, which a crank means is rotated forwardly to drive a chain system directly.

- 5 Fig. 2 showing an embodiment according to the present invention, which the crank means is rotated backwardly to drive the chain system indirectly through a pair of transition gears.

Fig. 3 is a perspective view of a preferable embodiment of the present invention.

- 10 Fig. 4 is a partial explosive view of Fig. 3.

Fig. 5 is a perspective view of a rear wheel-lifting stand used for an indoor exercise according to the present invention.

Fig. 6 is a perspective view to show the rear wheel-lifting stand is used to the exercise bicycle for an indoor exercising.

- 15 Fig. 7 is an embodiment, which has a group of reduction chain wheels mounted at a rear portion of the chain system.